



PERINATAL OUTCOME OF PREECLAMPSIA IN A TERTIARY HOSPITAL IN NORTH-EAST INDIA

Gynecology

Satadip Deb Roy	Junior Resident, Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal
Aheibam Bidya Devi*	Senior Resident, Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal *Corresponding Author
Yaseera Ali	Junior Resident, Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal
Phijam Aruna Devi	Junior Resident, Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal
Chongtham Shyamsunder Singh	Associate Professor and Head, Department of Pediatrics, Regional Institute of Medical Sciences, Imphal
Leiphrakpam Ranjit Singh	Professor and Head, Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal

ABSTRACT

Preeclampsia is a very important cause of maternal and perinatal morbidity and mortality especially in low-income and middle-income countries including India. This study was aimed at determining the perinatal outcome of preeclampsia in a tertiary level hospital in North-East India. This cross-sectional analytical study was conducted at Regional Institute of Medical Sciences, Imphal from October 2016 to March 2018. Descriptive statistics like mean, standard deviation, percentage and inferential statistics like Chi-square test, Fisher's exact test were used for analysing the data. Out of 96 preeclamptic women, 84 (87.5%) delivered live babies and 12 (12.5%) gave birth to intrauterine death (IUD) babies. Majority of the newborns (57.3%) were term followed by preterm (26.1%). Early preterm delivery was significantly associated with early neonatal death ($p < 0.001$). The mean birth weight of newborn was 2.43 ± 0.80 kg and the birth weight of less than 2.5kg was significantly associated with perinatal death ($p < 0.001$). There were 16.7% of newborns who had Apgar score of less than 7 at 5 minutes and required resuscitative measures and 19.8% of newborns got admitted mainly due to prematurity and birth asphyxia. There were 5 cases (5.2%) of early neonatal deaths and 17 (17.7%) cases of perinatal deaths. In the present study, the most common cause of early neonatal death was hyaline membrane disease (HMD) accounting for 40% of deaths. It was concluded that gestational age and birth weight of newborns were the main predictors of early neonatal death as well as perinatal death in preeclampsia.

KEYWORDS

Perinatal mortality, Preeclampsia

INTRODUCTION

Hypertensive disorders of pregnancy is a multisystem disorder with unknown etiology. It remains among the most significant and intriguing unsolved problems in obstetrics in both developed and developing countries that contributes greatly to maternal and perinatal morbidity and mortality.¹ While hypertensive disorders complicate 6% to 10% of all pregnancies in the United States, the incidence is believed to be even higher in underdeveloped countries.² The incidence of preeclampsia in hospital practice varies widely from 5-15% in India.³

A secondary analysis from the World Health Organization (WHO) multicountry survey showed that there were 3 and 5 fold increased risk of perinatal deaths in women with preeclampsia and eclampsia respectively.⁴ Specifically, the perinatal mortality in women with hypertensive disorders was reported as 106/1000 births from Accra/Ghana⁵, 144/1000 births from Kocaeli/Turkey⁶ and 317/1000 births from Jimma/Ethiopia.⁷

The risks posed by preeclampsia to the foetus and neonate include severe intrauterine growth restriction (IUGR), intrauterine foetal death (IUD), preterm birth leading to respiratory distress syndrome or hyaline membrane disease (HMD), birth asphyxia causing hypoxic ischaemic encephalopathy (HIE) and cerebral palsy, early onset sepsis, hypothermia, hypocalcemia, neonatal thrombocytopenia, bronchopulmonary dysplasia, perinatal morbidity and mortality.^{8,9,10,11}

Preeclampsia is one of the leading causes of both maternal and perinatal morbidity and mortality worldwide. Hence, the study was conducted in the institute to evaluate the perinatal outcome of patients with preeclampsia and to find out the remedial measures to improve it in this part of the country.

MATERIALS AND METHODS

This cross-sectional analytical study was carried out in the Department

of Obstetrics & Gynaecology in collaboration with the Department of Pediatrics, Regional Institute of Medical Sciences, Imphal from October 2016 to March 2018 on 96 preeclamptic women.

Sample size: 96 ($n=4PQ/I^2$) P=prevalence of adverse perinatal outcome of 39% in a study conducted by Tasmin et al in Bangladesh in 2015

Sampling design: Convenient sampling

Inclusion criteria: Preeclamptic women (BP $\geq 140/90$ mmHg and urine albumin $\geq 1+$ on dipstick single test) admitted at ward.

Exclusion criteria: Chronic hypertension, gestational hypertension, eclampsia, multifetal pregnancy, patients suffering from hepatitis, cardiac disease, renovascular hypertension, coarctation of aorta, diabetes mellitus, Cushing syndrome, primary aldosteronism, pheochromocytoma, thyroid disorders, glomerulonephritis and connective tissue disorders (Systemic Lupus Erythematosus, Polyarteritis nodosa, scleroderma).

Data management and statistical analysis

Data was checked for consistency and completeness and analysed by using SPSS version 21.0 IBM. Descriptive statistics like mean, standard deviation and percentage were used. Inferential statistics like Chi-Square Test and Fisher exact test were used. P value of < 0.05 was considered as statistically significant.

RESULTS

During the study period, the total number of antenatal patients admitted in the ward was 15,057; out of this, there were 1,455 preeclamptic women. Hence, the frequency of preeclampsia in the institution was 9.7%. Majority of the participants were multigravida

(57.3%) and were in the age group of 20 to 34 years (77.1%). Out of 96 subjects, 84 (87.5%) delivered live born babies and there were 12 (12.5%) IUD babies. The mean birth weight in the study population was 2.43 ± 0.80 kg.

As shown in Table 1, most (70.8%) were booked and it was also found that more perinatal deaths (58.8%) occurred in unbooked patients. It was also observed that babies with birth weight of less than 2.5kg was associated with significant perinatal death ($p = <0.001$) as shown in Table 1.

Table 1: Booking status, birth weight and maternal age in relation to perinatal death

Variables	Perinatal death		Total (n=96)	P value
	No (n=79)	Yes (n=17)		
Booking Status				
• Booked	61(77.2%)	7(41.2%)	68(70.8%)	0.006**
• Unbooked	18(22.8%)	10(58.8%)	28(29.2%)	
Birth Weight (kg)				
• Less than 1kg	0(0%)	2(11.8%)	2(2.1%)	<0.001**
• 1 to 1.49 kg	5(6.3%)	8(47.1%)	13(13.5%)	
• 1.5 to 2.49kg	23(29.1%)	6(35.3%)	29(30.2%)	
• 2.5 to 3.99kg	48(60.8%)	1(5.9%)	49(51%)	
• 4kg or more	3(3.8%)	0(0%)	3(3.1%)	
Maternal age in years				
• Less than 20	1(1.3%)	1(5.9%)	2(2.1%)	<0.001**
• 20 to 34	60(75.9%)	14(82.4%)	74(77.1%)	
• 35 or more	18(22.8%)	2(11.8%)	20(20.8%)	

Chi-Square/Fisher's Exact Test

As shown in Table 2, there were 16.7% of newborns who had Apgar score of less than 7 at 5 minutes and required resuscitative measures.

Table 2: Distribution of newborns according to Apgar score

Apgar Score	Frequency (n=96)	Percentage
At birth		
• 0	12	12.5
• 1-3	5	5.2
• 4-6	4	4.2
• 7 & more	75	78.1
At 5 min		
• 0	12	12.5
• 1-3	0	0.0
• 4-6	4	4.2
• 7 & more	80	83.3

Table 3 showed that out of 96 newborns, 19 (19.8%) newborns were admitted (9.4% in the neonatal intensive care unit and 10.4% in the general pediatrics ward). It was further observed that prematurity and birth asphyxia were the common causes of admission. Preterm babies accounted for 88.9% of total neonatal intensive care unit (NICU) admission and 50% of overall general ward admission. The mean duration of hospital stay for newborns was 7.8 ± 5.9 days after admission. There were 5 cases (5.2%) of early neonatal deaths and 17 (17.7%) cases of perinatal deaths. Hence, the perinatal mortality rate in our study was 177/1000 total births.

Table 3: Gestational age in relation to newborn admission

Gestational age(in weeks)	Admission			Total (n=96)	P value
	Not done (n=77)	NICU (n=9)	General ward (n=10)		
• 28-33	4(5.2%)	6(66.7%)	1(10%)	11(11.5%)	<0.001*
• 34-36	8(10.4%)	2(22.2%)	4(40%)	14(14.6%)	
• 37-38	35(45.5%)	1(11.1%)	5(50%)	41(42.7%)	
• 39-40	14(18.2%)	0(0%)	0(0%)	14(14.6%)	
• 40-42	16(20.8%)	0(0%)	0(0%)	16(16.7%)	

Chi-Square/Fisher's Exact Test

It was also observed that the most common early neonatal complication was hyaline membrane disease (HMD) followed by early onset sepsis with HMD contributing to 40% of early neonatal deaths followed by hypoxic ischaemic encephalopathy (HIE) of 20%. In 58.8% of perinatal deaths, there were no associated maternal

complications. Only 17.6% of perinatal deaths were associated with placental abruption which was statistically significant ($p=0.037$) as described in the Table 5. In the study, 18.8% of women presented with IUGR. There was no specific congenital anomaly found in the study.

Table 4: Distribution of early neonatal complications

Early neonatal complications	Frequency (n=19)	Percentage
HMD	5	26.3
Early onset sepsis	4	21.1
Hypoglycemia	2	10.5
Neonatal hyperbilirubinemia	3	15.8
HIE	1	5.3
Both (HMD + HIE)	2	10.5
No complication	2	10.5

Table 5: Association of maternal complications in relation to perinatal death

Maternal complications	Perinatal death		Total	P value
	No	Yes		
Uncomplicated	62(78.5%)	10(58.8%)	72(75%)	0.090
Anasarca	9(11.4%)	1(5.9%)	10(10.4%)	0.500
Abruption	2(2.5%)	3(17.6%)	5(5.2%)	0.037*
HELLP syndrome	4(5.1%)	0(0%)	4(4.2%)	1.000
Acute renal failure	0(0%)	1(5.9%)	1(1%)	0.177
Postpartum hemorrhage	1(1.3%)	0(0%)	1(1%)	1.000
Hypertensive retinopathy	0(0%)	1(5.9%)	1(1%)	0.177
Acute hepatic failure	0(0%)	1(5.9%)	1(1%)	0.177
Pulmonary edema	1(1.3%)	0(0%)	1(1%)	1.000
Total	79(100%)	17(100%)	96(100%)	-

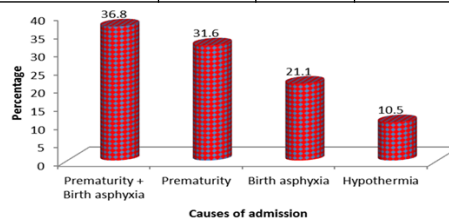


Figure 1: Distribution of admitted babies according to causes of admission

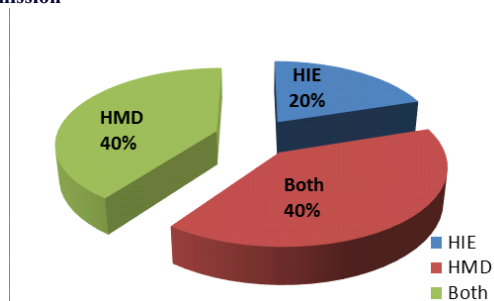


Figure 2: Distribution of early neonatal death according to causes of death

DISCUSSION

Out of 96 newborns, the majority of the newborns (57.3%) were term followed by preterm (26.1%) which was comparable to the observation of Tasmin SF et al¹⁰ with 61% term delivery and 25% preterm delivery. More than half of all preterm deliveries (56%) were late preterm which was comparable to the finding of Sibai BM¹⁸ where it was also more than half.

In the present study, the commonest mode of delivery was vaginal delivery (57.3%) followed by lower segment caesarean section (LSCS) of 41.7%. Of all deliveries, only 8.3% were instrumental deliveries which was similar to the one reported by Saxena N et al¹⁴ (8.1%) and Pairu J et al¹⁵ (7.9%). It was also found that neonates with birth weight less than 2.5kg were significantly associated with perinatal deaths (94.1%) which was comparable to the observation of Okanlawon SOA et al¹⁶ (90%).

Apgar score at 5 min was less than 7 in 38.6% of newborns in the study of Doddamani GB et al.⁸ However, Swamy MK et al.¹³ found that 17.33% of newborns had Apgar score less than 7 at 5 min which was comparable to the present study (16.7%). Kongwatanakul K et al.¹⁷ reported that resuscitation was needed for 15.8% of newborns which was similar to the present study where it was 16.7%.

Newborns necessitating admission were reported to be 26.6% in the study conducted by Doddamani GB et al.¹³, 41% by Hassan M et al.¹¹ and 58% by Viswanathan M et al.¹² compared with 19.79% of newborns getting admitted in the present study. Swamy MK et al.¹³ also reported that 69.33% of all liveborn babies required admission and there was no statistically significant difference between gestational age and NICU admission. But in our study, preterm babies accounted for 68.4% of total newborn admissions with 42.1% at NICU and 26.3% at general ward. The mean duration of hospital stay was 7.8±5.9 days which was similar to the result observed by Viswanathan M et al.¹² where the mean duration was 8.2 days.

The study done by Kiondo P et al.⁹ showed a similar incidence of IUD (13.1%) like our study (12.5%). Doddamani GB et al.⁸ reported the perinatal mortality rate (PMR) to be 174/1000 total births which was similar to our observation (177/1000). In 58.8% of total perinatal deaths, there were no associated maternal complications. However, there was a significant risk ($p=0.037$) of perinatal death (17.6%) in case of placental abruption due to preeclampsia. Other maternal complications in the form of anasarca, acute renal failure and acute hepatic failure were also associated with perinatal deaths.

Hence, it was observed that gestational age and birth weight of newborns were the main predictors of early neonatal death as well as perinatal death in the study.

CONCLUSION

Maternal mortality in preeclampsia is largely preventable but perinatal morbidity and mortality still remain very high in developing countries that include India because of prematurity and low birth weight babies leading to hyaline membrane disease and other fatal complications. Expectant management of early onset severe preeclampsia where woman and foetus are otherwise stable in a tertiary care institution with pragmatic cut off point allows valuable time to be gained and is an acceptable option of management to improve the perinatal outcome.

Regular antenatal examinations, timely referral and appropriate intervention at tertiary care centres, judicious termination of pregnancy and well equipped NICU facilities can help in improving the maternal and neonatal outcome of the disease. Moreover, better public health awareness about the disease and improvement of socio-economic condition of the people can also reduce the maternal and perinatal morbidity and mortality of the disease.

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